UPS + AVR

Uninterruptible Power System

User's Manual

Line-Interactive Sine Wave

(Long backup models: SS-750L/1000L/1500L/2000L)

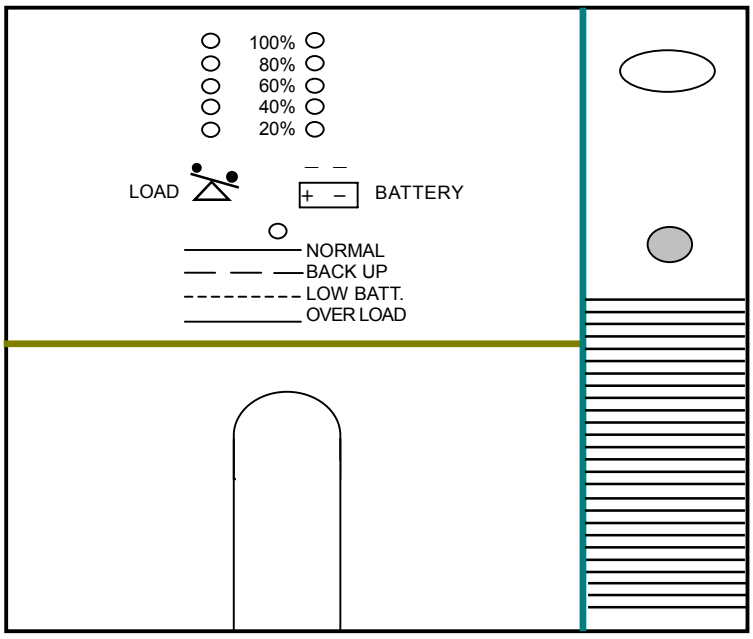


TABLE OF CONTENTS

For Long run models: SS-750L/1000L/1500L/2000L only ---------- Page 3 – 4
1. INTRODUCTION
1.1 Overview 1.2 Battery replacement warning
1.3 Communication interface

2. MAIN FEATURES ---------- Page 5

3. CAUTION ---------- Page 5

4. INSTALLATION AND OPERATION ---------- Page 6
4.1 Installation
4.2 Operation
4.3 Connecting the FAX machine

5. INDICATION AND CONTROL ---------- Page 7 – 8
5.1 Battery level and load level LEDs
5.2 Operation status LED
5.3 Audible alarm
5.4 Auto self-test function
5.5 DIP switch settings
5.6 Remote control
5.7 Reset the UPS

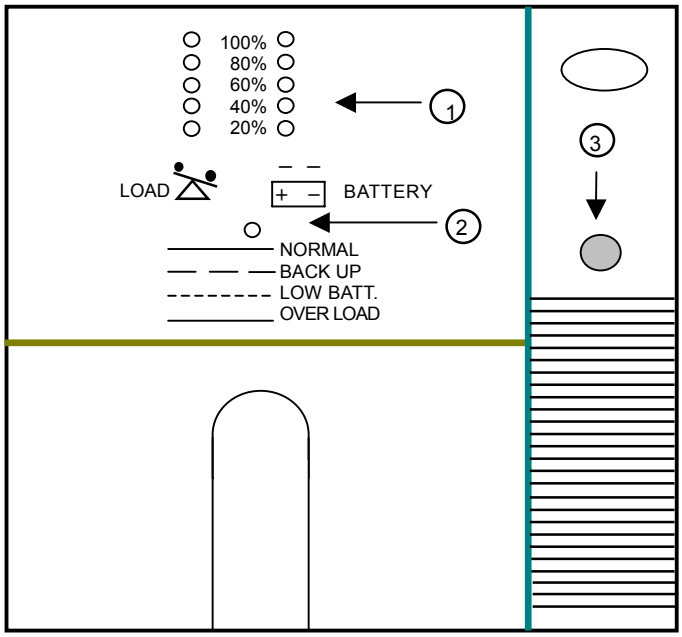
6. COMMUNICATION INTERFACE ---------- Page 9
6.1 The definition and setup for RS-232
6.2 The definition and setup for DB9 (optional)

7. TROUBLE SHOOTING ---------- Page 10

8. SPECIFICATIONS ---------- Page 11

9. IMPORTANT SAFETY INSTRUCTIONS ---------- Page 12

FRONT PANEL FOR ALL MODELS



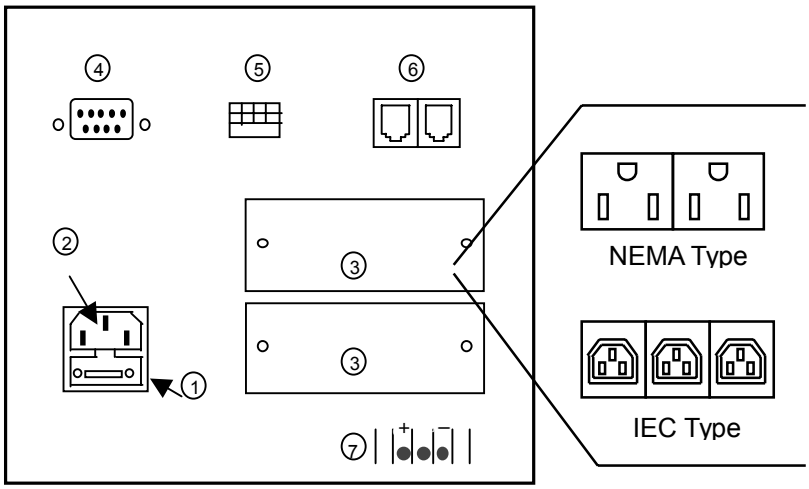
① LEDs of battery voltage level and load level.

② LED of operation status.

③ Control button.

For long run models: SS-750L/1000L/1500L/2000L only

Rear Panel



① Fuse.

② Inlet of city power.

③ Outlets (NEMA/IEC).

④ RS-232 Interface.

⑤ DIP switch

⑥ Phone jacks for fax machine (optional by DIP switch).

⑦ Battery connector.

1. **INTRODUCTION** (for long run models: SS-750L/1000L/1500L/2000L only)

1.1 Overview:

The series UPS is an advanced Line-Interactive Uninterruptible Power System which produces pure sine wave power to your equipment; unlike the traditional off-line UPS, the series provide very short transference when blackouts happen, and zero transference from AC mode to battery mode or from battery mode to AC mode. The voltage regulation performance of the series is similar to an On-line UPS; however, the series provide efficiency over 98% under normal power condition. Two charge modes, quick charge and trickle charge, are provided to maintain the batteries in the best condition.

1.2 Battery replacement warning

The self-test function (by pushing the button) will inform you with an alarm when the batteries are weak and require replacement.

1.3 DIP switches

The DIP switches allow you to adjust the UPS for different line voltages and frequencies in different areas. It also allows you to enable the green power function to shut down the UPS automatically if the load is less than 25W, and then to extend the battery life.

1.4 Communication interface

A communication interface port for sensing input voltage, output voltage, battery capacity, output power level, and UPS statuses are provided; through this port, you can remote control the UPS for turning on and off by customized schedule and setting the auto-test procedure.

2. MAIN FEATURE:

* Line-Interactive structure.
* Microprocessor based design.
* 'Green Power' design with auto on/off function.
* RS-232 interface for communication.
* Protection for overload, short circuit, & over heat.
* Pure sine wave output.
* Zero Transference.

3. CAUTION:

* The UPS is designed to power computer loads and the associated peripheral devices, such as monitors, modems, external H-Disk drivers, etc. To ensure the performance of the UPS, Do Not load the UPS with laser printer, motor, or any type of inductive load.
* Connecting the UPS to a two-pole, three-wire grounding mains receptacle. Connection with any other type of receptacle may result in a shock hazard and may violate local electrical codes.
* Do not allow water or any foreign object to get inside the UPS. And do not put objects containing liquid on or near the unit.
* Keep UPS away from fire or heating sources.

4. INSTALLATION & OPERATION:

4.1 Installation

* Inspecting the packing carton for damage that may have occurred while in transit. Immediately notify the carrier and place of purchase if any damage is found. Retain the package for future use.

* Plugging the power cord to a 3-wire grounding receptacle. If an extension cord must be used between the UPS and the nearest wall outlet, use a 3-wire grounding type rated for at least 20 Amps.

* Connecting your equipment to the UPS. To ensure that your computer equipment will be protected during a utility failure, it is important to make sure that the maximum power need from the equipment is not over the rated capacity of the UPS. Red LED will lighted up and alarm will beep if the load is over the rated value. Meantime, if the overload is severe, the UPS will shut down immediately for protecting UPS itself.

4.2 Operation

4.2.1 After installation with normal city power, the UPS will charge the battery automatically, and the status LED blinks green every 2 seconds. Please push the button about one second on the front panel, then the UPS will give power to the outlets after a short-time of self-test.

4.2.2 Pushing the button for 4 seconds, the UPS will turn off the power on the outlets. But, the UPS will keep charging if city power is normal. To stop the charging, please pull out the power cord to shut down the UPS completely.

4.2.3 During a blackout, push the button for entering idle mode (Ref. Indication Table), then push again for one second, and the UPS will be turned on and enter into backup mode. To turn off the power from UPS; please push the button for 4 seconds, then UPS status LED will blink orange every 2 seconds, wait for 5 seconds, and UPS will turn off the power automatically.

4.2.4 In idle mode, UPS will turn off the power automatically within 12 seconds during a utility failure; while UPS will keep charging the batteries if the utility power is normal. When utility power is normal, please pull out the power cord if you want to turn off the UPS completely.

4.2.5 When “Green Power” function is enabled, the UPS will turn off the power within 30 seconds after blackout occurs with the power consumption lower than 25W.

4.3 Connecting the FAX machine:

When you are connecting a FAX machine or modem with the UPS, please also connect the phone line through the UPS. The UPS may offer protection against damaging power fluctuations and surges that travel through the phone line. The UPS also offers a ring on function when the power is off. UPS power will be turned on automatically when a ringing signal exists in the phone line, and the UPS will keep power on until the FAX machine finishes receiving work, then the UPS will be turned-off by the green power function. In a long-time blackout situation, you won’t miss any FAX data by this function.

5. INDICATION AND CONTROL

5.1 Battery level and load level LEDs

The battery level LEDs show the voltage level both in back-up mode and in normal mode. When the LED indicates 20% of the capacity in back-up mode, it means that the UPS is going to shut down; for the length of backup time left, it will depend on the load. While when all five LEDs light in normal mode, it means that the battery is fully charged.

The load level LEDs show the percentage of added load by the UPS rated capacity. When all five LEDs light, the UPS is over loaded.

5.2 Operation status LED

The status LED shows the UPS status, in the normal utility power duration, LED shows Green. In the event of a utility outage, LED shows Orange. If the UPS is under fault operation, LED shows Red.

5.3 Audible alarm

During a utility failure or fault operation, the UPS emits beep for warning. In back-up mode, the beeping can be silenced by pushing the button. However, the warning of low battery will still sound for urging user to leave computer without any data loss.

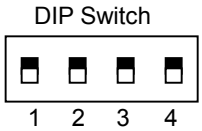
Basic Indication Table:

	LED	ALARM	PERIOD	STATUS
Idle mode	Green	No Beep	One flash every 2 sec.	Utility Good
	Orange	No Beep	One flash every 2 sec.	Utility outage
	Red	No Beep	One flash every 2 sec.	Timer on, refer to Item 5.6
Normal/ Back-up mode	Green	No Beep	Continuously	Normal (Utility good)
	Orange	Yes, can be silenced	One beep every 4 sec.	Back-up (No load)
			2 beeps every 4 sec.	Back-up (Loading)
	Orange	No, can Not be silenced	4 beeps per sec.	Battery Low
	Red	Yes	8 beeps per sec.	Battery NG.

5.4 Auto self-test Function:

In normal mode of UPS, turn on your computer and push the button on the front panel for self-test. The UPS will simulate a power outage and transfer your load to the UPS battery. If low battery warning sounds during the test, it means that the battery set is weak and requires extended recharge. If battery NG warning sounds, it means that the battery set is damaged and requires replacement.

5.5 DIP Switch Setting



Function Table of DIP Switch

Switch No. / Function	1		2		3		4	
	Up	Down	Up	Down	Up	Down	Up	Down
Voltage = 100V / 200V		V	V					
Voltage = 110V / 220V	V		V					
Voltage = 115V / 230V	V			V				
Voltage = 120V / 240V		V		V				
Frequency for DC Start					50Hz	60Hz		
Green Power (Enable/Disable)							Yes	No

P.S.: Program setting active only after the UPS is re-started.

5.6 Remote Control:

The UPS can be set for daily shutdown/wake up. This command must be set through the RS-232 interface. When this function is set, the timer inside the UPS will begin to run, and the load will be turned off by the shutdown/wake up schedule. During the period of turn off to the next turn on, the status LED blinks red every 2 seconds. .

5.7 Reset the UPS

If any abnormal condition occurs, and the item 4.2.1 ~ 4.2.4 can not be executed, please push the button for at least 10 sec. until the status LED becomes orange, then the UPS is reset.

6. COMMUNICATION INTERFACE:

The UPS provides both computer interfaces, smart software (RS-232) and dry contact (DB-9); by using different software and cable, the UPS shows different monitoring function.

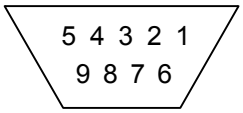
6.1 The definition and setup for RS-232 is as following:

Baud Rate : 2400 dps

Data Length : 8 bits

Stop Bit : 1 bit

Parity : None



Pin #6 : RS-232 data Tx out.

Pin #7 : Common of Pin #6 and Pin #9

Pin #9 : RS-232 data Rx In

6.2 The definition and setup for DB9 (optional) is as following:

Pin #2 : AC Power Failure

Pin #4 : Common GND of Pin #2 & Pin #5

Pin #5 : UPS Battery Low

Pin #6 : Turn off UPS

Pin #7 : GND of Pin6

The interface with computer is diagramed as above for your reference. Use Pin #4 as the common of Pin #2 and Pin #5, Pin #2 and Pin #4 will become close loop from open when the utility fails, Pin #5 and Pin #4 will become close loop from open when the battery level is low.

The UPS will shut down itself when the high level signal from RS-232, sustained for 3 seconds, is applied between Pin #6 and Pin #7.

7. TROUBLE SHOOTING

Problem	Possible Cause	Action to Take
UPS no reaction while AC is connected	1. Line cord plug is loose 2. Fuse on rear panel blown (Inside the drawer of inlet) 3. Dead wall socket	1. Check the line cord plug 2. Replace fuse 3. Check wall socket with a table lamp.
Power output is normal, UPS emits continuous beep, status LED shows RED.	UPS is over loaded	Turn off UPS and unplug excessive loads from UPS.
UPS emits continuous beep, status LED show RED, & no power on outlets.	UPS has shut down due to overload.	Unplug excessive loads from UPS, press button to reset the buzzer, and turn on the UPS again.
UPS does not provide expected run time	1. Excessive loads connected at UPS outlets. 2. Battery is weak and can not provide enough capacity.	Do not operate the UPS, and leave the UPS plugged in for 10 hours. Then, test it again, if UPS still can not provide expected run time, battery should be replaced.
Button on front panel doesn't work	1. The CPU inside UPS is not running correctly. 2. Button damaged.	1. Push the button for 10 seconds to reset the UPS. 2. Unplug line cord and all loads from the UPS to let it shut down automatically, and call for service.
To push button for testing under AC mode, UPS emits urgent beep (8 beeps per sec.) and RED LED blinks at the same time.	Battery is weak and should be replaced	Replace batteries.
UPS can not be turned on.	1. Battery polarity wrong 2. UPS fault	1. Check battery connection. 2. Call for service.

8. SPECIFICATIONS:

Specifications for long run models SS-750L/1000L/1500L/2000L:

MODEL / CAPACITY	SS-750L (750VA)	SS-1000L (1000VA)	SS-1500L (1500VA)	SS-2000L (2000VA)
Continuous Loading	**500W**	**700W**	**900W**	**1200W**
Max. Loading	750W (< 30sec.)	1000W (< 30 sec.)	1500W (< 30 sec.)	2000W (< 30 sec.)
INPUT Voltage Frequency	Selectable 100/110/115/120V 1ø or 200/220/230/240V 1ø 50Hz/60Hz Auto detect			
Current (110V/220V)	8A / 4A	10A / 5A	16A / 8A	20A / 10A
OUTPUT Voltage	100/110/115/120V 1ø or 200/220/230/240V 1ø ±3% for Back-up Mode < ±10% for AVR			
Frequency	50Hz or 60Hz ± 0.1Hz (Selectable under DC start)			
Wave Form	True Sine Wave			
Current (110V/220V)	6.8A / 3.4A	9.1A / 4.6A	13.6A / 6.8A	18.2A / 9.1A
TRANSFER TIME	Transfer Time < 3 ms			
BATTERY Voltage	36V 24V (optional)	48V 36V (optional)	48V	72V
Level Ind.	YES	YES	YSE	YSE
Protection for reverse battery polarity	YES	YES	YES	YES
CHARGE Voltage	40.95V / 27.3V	54.60V / 40.95V	54.60V	81.90V
Maximum Current	6A	6A	6A	6A
LED / ALARM INDICATION	LED	Alarm		
Normal city power	GRN Lighting	No beep		
Back up Mode	ORG Flashing	B-B----B-B---- (2 beeps/4sec.)		
Abnormal Freq. of City power (Frequency > 65Hz or < 47Hz)	ORG Flashing (quick)	B-B----B-B---- (2 beeps/4sec.) (Transfer to backup mode)		
Abnormal Voltage of City power (Voltage > 126% or < 77%)	ORG Flashing (slow)	B-B----B-B---- (2beeps/4sec.) (Transfer to backup mode)		
Low Battery Alarm	ORG Flashing	B-B-B-B-B-B------- (4 beeps/sec.)		
Battery Fail Alarm	RED Flashing	B · B · B · B · B · B · B · B · · (8 beeps/sec.)		
Over load Alarm	RED Lighting	B…….. (continuously)		
Thermal Alarm	RED Flashing	G · · · · . R · · · · . (G = 16beeps/2sec. R = silence / 2sec.)		
LOAD LEVEL INDICATION	YES	YES	YES	YES
DC START / ALARM RESET	YES	YES	YES	YES
RS-232 INTERFACE	YES	YES	YES	YES
ENVIRONMENT TEMP.	0 - 37 ℃			
ENVIRONMENT HUMIDITY	30-95% Non-Condensing			
DIMENSIONS (L x H x W)	45 x 20 x 18 (cm)	45 x 20 x 18 (cm)	45 x 20 x 18 (cm)	45 x 20 x 18 (cm)
SHIPPING DIM. (L x H x W)	54 x 33 x 30 (cm)	54 x 33 x 30 (cm)	54 x 33 x 30 (cm)	54 x 33 x 30 (cm)
WEIGHT (N.W. / G.W.)	13.0/14.0 kgs	14.5/15.5 kgs	17.5/18.5 kgs	17.5/18.5 kgs

9. IMPORTANT SAFETY INSTRUCTIONS

- When replacing the batteries, use the same number and the same type of batteries.
- Do not dispose of batteries in a fire; the battery may explode.
- Do not open or mutilate the battery or batteries, released electrolyte is harmful to the skin and eyes.
- A battery can present a risk of electric shock and high short circuit current. The following precaution should be observed when working on batteries.
  * Remove watches, rings or other metal objects.
  * Use tools with insulated handles.
- To prevent an overbalance of this unit, with the installation the additional stabilizer are to mount at the bottom side.
- This unit should be installed from service personnel.
- The equipment can be operated by any individuals with no previous experience.
- “The socket-outlet shall be installed near the equipment and easily accessible.”
- “With the installation of this equipment it should be prevented, that the sum of the leakage current of the UPS an the connected consumer does not exceed 3.5mA.”
- Attention, hazardous through electric shock. Also with disconnection of this unit from the main, hazardous voltage still may be accessible through supply from battery.
- The battery supply should be therefore disconnected in the plus and minus pole through the from the outer enclosure accessible battery fuses when maintenance or service work inside the UPS is considered.
- The lead acid battery may cause chemical hazard.
- The battery presents a risk of electric shock and energy hazard.
- Batteries are to be disposed by the manufacturer or importer. Customers need to send them back with no charge for disposal.
- Electrical hazard, the discharge time is about 5 min.

German wording:

- Wenn Sie die Batterien austauschen, verwenden Sie bitte die gleiche Anzahl und den gleichen Batterietyp.
- Werfen Sie niemals die Batterien in das Feuer, die Batterien könnten explodieren.
- Öffnen oder beschädigen Sie nicht die Batterien, ausfileßendes Elektrolyt ist schädlich für Haut und Augen.
- Eine Batterie kann eine Gefahz eines elektrischer Schlages und sehr groβer Kurzschluβströme beinhalten. Folgenda Vorkehrungen soiiten getroffen warden, wenn Sie mit der Battery arbeiten.
  * Entfernen Sie Uhren, Ring and andere metallische Objekte.
  * Verwenden Sie Werkzeug mit isolierten Griffen.
- Um ein Umkippen dieses Gerätes zu verhindern, sind mit der Installation dieses Gerätes die zugätalichen Stützen an der Unterseite dieses Gerätes anzubringen.
- Dieses Gerät ist durch Elektrofachkräfte zu installieren.
- Bedienung durch jedermann ohne dem Vorkenntnisse.
- “Die Steckdose muβ nahe dem Gerät angebracht und leicht zugänglich sein.”
- “Bei der Installation dieses Gerätes ist darauf zu achten, daβ die Summe der Ableitstöme der USV und der angeschlossenen Verbraucher den Maximalwert von 3.5mA nicht Überschreiten.”
- “Vorsicht, Gefahr durch elektrischen Schlag. Auch nach Trennung von der Netzeingangsspannung werde Teile innerhalb der USV von der Batterie gespeist und führen gefährliche Spannung.
- Bei Instandhaltungsarbeiten ist daher die Versorgung durch die Batterie an den von auβen zugänglichen Sicherungshaltern in beiden Polen zu unterbrechen.”
- Die Blei-Akkumulatoren Können bei unsachgemäβer Handhabung chemische Gefahren hervorrufen.
- Die Batterie birgt eine Gefahr eines elektrischen Schlages und sehr hoher Kurzschluβstroeme.
- Batterien werden durch den Hersteller oder Importeur entsorgt. Dazu muessen die Batterien kostenfrei angeliefert werden.
- Gegahr durch elektrischen Schlag, die Entladeit dieser Kondensatoren beträgt 5 min.